

PAT-NO: JP411119896A

DOCUMENT-IDENTIFIER: JP 11119896 A

TITLE: ABACUS TYPE INPUT DEVICE, ABACUS PRACTICE  
DEVICE, AND  
NETWORK OF THE SAME

----- KWIC -----

Abstract Text - FPAR (1):

PROBLEM TO BE SOLVED: To provide an abacus type input device that can perform a sure signal output in accordance with a register operation on the abacus and can serve as an keyboard by providing character input function and to provide an abacus practice device, and its network with which a practice of calculation on the abacus or a simulated licensing examination can be performed.

Abstract Text - FPAR (2):

SOLUTION: The abacus body part 10, which consists of abacus beads 11 that can shield magnetism and a magnetic shaft sticks 12 passing through the abacus beads 11, is made upper side, a signal processing pat part 20, which is arranged by corresponding many hole sensor elements 12 for detecting a position of each of the abacus beads 11 to a moving area of the abacus beads 11, is made lower side and the abacus body part 10 is piled up in separable or retreatable condition.

Title of Patent Publication - TTL (1):

ABACUS TYPE INPUT DEVICE, ABACUS PRACTICE DEVICE, AND NETWORK OF THE SAME

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

[Field of the Invention] Even if it does not go to an abacus classroom further, this invention relates to the abacus practice equipment which enabled it to perform practice and simulation assay of abacus calculation by each one, and its network about the abacus blocking force equipment also demonstrates the function of an alphabetic character input and it enabled it to use instead of the keyboard of a personal computer, while being able to perform a positive signal output according to the number actuation of \*\* of an abacus.

[0002]

[Description of the Prior Art] It is said that the speed of the addition and subtraction which use an abacus is quicker than the case where a figure is generally inputted into a calculator. However, when calculating multiplication and division, it is quick rather than the direction calculated with a calculator calculates on an abacus. Therefore, the product which combined the abacus and the calculator is commercialized. Thus, an abacus does not replace a calculator and the regular user of an abacus still exists. moreover, there is [ point / which can deepen understanding of the foundation of mathematics, such as decimal number system, including scaling only as training which heightens count capacity, and promotes the so-called development of a right brain with improvement in mental-arithmetic capacity or concentration ] much count using an abacus -- it is alike and the use is improved.

[0003] The method of on the other hand writing down the result which the examinee calculated on the abacus in a mark sheet in the qualification test of abacus calculation currently performed to the regular user of an abacus is adopted. Since an examinee has to enter exactly in order to read correctly the answer entered in the mark sheet by the reader, the burden has been given to the examinee not a little.

[0004] For this reason, the abacus input unit it enabled it to grade even if an examinee did not enter an answer in a mark sheet is indicated by JP,6-86123,U. It is made for this abacus input device to output the number of \*\* of an abacus as an electrical signal with the location detection means equipped with the bead which inserted the permanent magnet of the shape of an acute ring in the periphery, and the magnetic resistance element which detects the condition or the condition of having fallen which said bead is going up.

[0005] Therefore, this abacus input device can be used like a calculator, and also it can also constitute the computer network system which performs a game or qualification test of the abacus calculation in two or more halls using two or more number processors of abacus \*\*.

[0006]

[Problem(s) to be Solved by the Invention] The abacus input device indicated by JP,6-86123,U detects whether it is in the condition which the bead is going up, or it is in the condition which has fallen by the magnetic resistance element, as described above, and it inserts the permanent magnet of the shape of an acute ring in the periphery of a bead, and he is trying to produce a field from the bead itself. For this reason, when moving a bead and detecting that location, there was a trouble that the field of a bead influenced mutually and the number of \*\* could not detect certainly. Moreover, when giving magnetism to the bead itself, as described above, structure also became complicated, and since there were many the numbers, it had also become the cause of a manufacturing-cost rise of equipment.

[0007] Furthermore, since the conventional abacus input device was outputted by making the number of \*\* of an abacus into an electrical signal, it could be used instead of the so-called number key of \*\*, but since there was no function of an alphabetic character input, it was not able to be used instead of the keyboard of a personal computer.

[0008] Moreover, although, as for the abacus input unit indicated by JP,6-86123,U, the engine performance is utilized especially in a game, a qualification test, etc. of abacus calculation, the equipment for inputting alphabetic characters (a figure being included), such as an examinee's name and an examinee's number, in a qualification test is needed

separately. Furthermore, this abacus input unit was not able to perform practice or simulation assay of abacus calculation by each one.

[0009] Then, this invention can perform a positive signal output according to the number actuation of \*\* of an abacus, and it aims at offering the abacus practice equipment which enabled it to perform practice and simulation assay of abacus calculation by each one, and its network while it offers the abacus blocking force equipment also demonstrates the function of an alphabetic character input and it enabled it to use instead of the keyboard of a personal computer.

[0010]

[Means for Solving the Problem] The 1st abacus input unit for solving the above-mentioned technical problem The bead which is abacus blocking force equipment which outputs the signal according to the number of \*\* of an abacus, and can carry out magnetic shielding to the arithmetic unit which connected external storage, an output unit, etc., The body section of an abacus which consists of a shaft made from a magnet which penetrates a bead, It consists of the signal-processing putt section which the Hall sensor component of a large number which detect the location of each bead of this body section of an abacus was made to correspond to the migration field of a bead, and has arranged it. While arranging the above-mentioned body section of an abacus to the up side and arranging the above-mentioned signal-processing putt section to the down side, it is characterized by carrying out polymerization installation of the body section of an abacus to the signal-processing putt section in the condition in which separation or evacuation is possible among these Ryobe.

[0011] By according to the 1st above abacus blocking force equipment, constituting from a bead which can carry out magnetic shielding of the body section of an abacus, and a shaft made from a magnet which penetrates a bead, and moving the bead which carries out magnetic shielding Since change of the field produced in the shaft side by which fixed installation was carried out is caught and he is trying to detect the location of a bead, what were tinctured with magnetism moves, influencing mutually is lost, and the number of \*\* by the bead can be detected certainly. Moreover, since the body section of an abacus is installed possible [ separation or evacuation ] to the signal-processing putt section, the signal-processing putt section itself can be used independently.

[0012] the 2nd abacus blocking force equipment for solving the above-mentioned technical problem be characterize by to be what function as an alphabetic character input means which can output the alphabetic character in which it be touched , and a notation by touching each Hall sensor component which the signal processing putt section of the 1st abacus blocking force equipment assign the alphabetic character and the notation to each Hall sensor component , and the alphabetic character and the notation assign with the input pen which have a magnet .

[0013] According to the 2nd above abacus blocking force equipment, by touching each Hall sensor component to which the alphabetic character and the notation are assigned to each Hall sensor component of the signal-processing putt section, and the alphabetic character and the notation were moreover assigned with the input pen which has a magnet, the code signal corresponding to the alphabetic character and notation with which it was touched can be outputted, and it can be used as an alphabetic character input means.

[0014] The 1st abacus practice equipment for solving the above-mentioned technical problem The abacus blocking force equipment which has the detection function to detect the location of a bead, The external storage which recorded the exercise of abacus calculation etc. with voice and/or an image, While computing the numeric value currently displayed on the above-mentioned external storage with the bead from the detection function of the voice regenerative apparatus which reads out the exercise of the abacus calculation memorized by voice etc., and abacus blocking force equipment It is characterized by having the arithmetic unit which judges a correct answer and a wrong answer as compared with the correct answer into which the numeric value was inputted from external storage, and the output unit which displays the image, and said correct answer and wrong answer of an exercise of the abacus calculation memorized by the above-mentioned external storage.

[0015] According to the 1st above abacus practice equipment, the exercise of the abacus calculation memorized by voice is reproduced by external storage with a voice regenerative apparatus, the count answer of the exercise is carried out by moving the bead of an abacus input device, by the arithmetic unit, it is judged whether it is a correct answer or it is a wrong answer, and the answer is displayed on an output unit.

[0016] The 2nd abacus practice equipment for solving the above-mentioned technical problem is characterized by abacus blocking force equipment being a thing according to claim 1.

[0017] According to the 2nd above abacus practice equipment, it is a thing according to claim 1, and since abacus blocking force equipment can detect the number of \*\* by the bead certainly, it ceases to malfunction as abacus practice equipment, and can raise the reliability of practice.

[0018] The 3rd abacus practice equipment for solving the above-mentioned technical problem is characterized by abacus blocking force equipment being a thing according to claim 2.

[0019] According to the 3rd above abacus practice equipment, since it has the function of an alphabetic character input of abacus blocking force equipment, it can also be used as a usual alphabetic character input device in addition to abacus practice.

[0020] The network of the abacus practice equipment for solving the above-mentioned technical problem is characterized by connecting much abacus practice equipments of a publication to the 3rd to 5th above either by the circuit.

[0021] Since according to the network of above abacus practice equipment many men can exercise to the same problem to coincidence when much abacus practice equipments are connected by the circuit, the game and qualification test of abacus calculation not only by study at each home but two or more participants can be performed without gathering in the hall of a piece place. Moreover, an answer text etc. can also be delivered through a circuit.

[0022]

[Embodiment of the Invention] The gestalt of implementation of this invention is explained referring to drawing 5 from drawing 1. In this abacus blocking force equipment 1, it connects with an arithmetic unit 30 and the abacus practice equipment 2 which the abacus blocking force equipment 1 concerning this invention consists of the body section 10 of an abacus shown in drawing 1 (a) and the signal-processing putt section 20 which functions as an alphabetic character input means shown in this drawing (b), and is applied to this invention is constituted, as shown in this drawing (c). That is, the abacus practice equipment 2 concerning this invention is constituted by connecting abacus blocking force equipment 1 to the personal computer which connects external storage 31, internal storage (not shown), and an output unit 33 to an arithmetic unit 30, and has not connected the input device which is a keyboard.

[0023] The body section 10 of an abacus of abacus blocking force equipment 1 has the detection function to detect the location of a bead 11, and enables it to output the numeric value which a bead 11 displays with the location of a bead 11 as an electrical signal. The shaft 12 made from a magnet penetrates the bead 11 which can carry out magnetic shielding, and a detection function stands face to face against the location before and behind the migration field of a bead 11, i.e., migration of a bead 11, and arranges many Hall sensor components 21. When sensed by the Hall sensor component 21 which the field made by the shaft 12 made from a magnet which the bead 11 moved and has been exposed made correspond to the migration field of a bead 11, and has arranged, the location as for which the bead 11 is vacant is detectable.

[0024] In order that a bead 11 may move in the die-length direction of a shaft 12, a Hall sensor component 21 arranges so that face to face may stand against the location before and behind migration of a bead 11, as shown in drawing 2, but a Hall sensor component 21 arranges corresponding to the location of alphabetic characters which assigned to the front-face side input screen of the signal-processing putt section 20 which functions as an alphabetic character input means arrange to the body section 10 down side of an abacus, and arranged, such as a hiragana and a figure, or a notation, as shown in drawing 1 (c). That is, the Hall sensor component 21 of the body section 1 of an abacus and the Hall sensor component 21 of the signal-processing putt section 20 should be made to serve a double purpose.

[0025] Therefore, the location of the alphabetic character which assigns to the front-face side input screen of the signal-processing putt section 20, and is arranged, or a notation is made equivalent to the location before and behind migration of a bead 11. Those with four piece, and since it moves in the vertical direction, respectively, 1 ball 11a can arrange five alphabetic characters corresponding to the location of 1 ball 11a. Since 5 ball 11b is only one piece which moves in the vertical direction, it can arrange two alphabetic characters and notations. therefore, the location before and behind migration of for example, 1 ball 11a -- corresponding -- " " -- it is -- obtaining -- obtaining -- " -- the keyboard side 22 can consist of arranging the alphabetic character of each line and arranging various kinds of notations corresponding to the location before and behind migration of 5 ball 11b.

[0026] Such a keyboard side 22 is made into the touch-sensitiveness which senses the MAG, and arranges the Hall sensor component 21 in the rear face of the key of each alphabetic character or a notation, respectively. The signal-processing putt section 20 makes a set such a keyboard side 22 and the input pen 25 as shown in drawing 4, and constitutes them. A magnet is attached in point 25a of the input pen 25, and if the point 25a touches an alphabetic character with the alphabetic character input section, the Hall sensor component 21 arranged at the rear face of the key of the alphabetic character and notation will sense the field produced with the magnet attached in point 25a of the input pen 25.

[0027] Thus, each Hall sensor component 21 arranged in the signal-processing putt section 20 corresponding to the location before and behind migration of a bead 11 is electrically connected with an arithmetic unit 30 through an interface board 27 and a RS232C cable, and the alphabetic character and notation which were outputted from the number of " " or the keyboard side 22 of a bead 11 are inputted into an arithmetic unit 30. By catching change of the field which the Hall sensor component 21 detected, an arithmetic unit 30 has the function to judge the code of the

alphabetic character inputted from the numeric value by which the number of \*\* was carried out with the bead 11, or the keyboard side 22, or a notation.

[0028] for example, 5 ball 11b -- going up -- 1 ball 11a -- all -- the bottom -- \*\*\*\* -- when it is, each Hall sensor component 21 which stands face to face against the part of the shaft 12 bottom which has penetrated 5 ball 11b, and the part by the side of the top of the shaft 12 which has penetrated 1 ball 11a can sense a field, and a bead 11 can judge that the arithmetic unit 30 is displaying "0." moreover, 5 ball 11b -- falling -- top 1 ball 11a -- a top -- \*\*\*\* -- when it is, the Hall sensor component 21 which stands face to face against the 2nd part can sense a field from on the part of the shaft 12 top which has penetrated 5 ball 11b, and the shaft 12 which has penetrated 1 ball 11a, and a bead 11 can judge that the arithmetic unit 30 is displaying "6."

[0029] About the signal-processing putt section 20, the alphabetic character and notation with which the input pen 25 was touched are directly recognized by the arithmetic unit 30. Kanji conversion can be enabled by connecting the storage incorporating a Japanese conversion function to an arithmetic unit 30. Therefore, the signal-processing putt section 20 is equipped with conversion / key non-"changed", decision / the "Enter" key 23 or the "mode change" key 24, etc.

[0030] Moreover, the number of \*\* of a bead 11 enables it to stand face to face against the predetermined Hall sensor component 21 by connecting on a hinge 15, as it is indicated in drawing 3 as the body section 10 of an abacus, and the signal-processing putt section 20, and positioning Ryobe 10 and 20. As it is indicated in drawing 3 as the body section 10 of an abacus, and the signal-processing putt section 20, where polymerization installation is carried out, abacus blocking force equipment 1 is constituted. And if the body section 10 of an abacus connected on the hinge 15 is made into the condition of having bounded as shown in drawing 4 and drawing 5, the signal-processing putt section 20 can be used as an alphabetic character input means.

[0031] External storage 31, the voice regenerative apparatus 32, internal storage (not shown), and an output unit 33 are connected to the arithmetic unit 30 which connected the above abacus blocking force equipments 1. External storage 31 is what recorded the image explaining the operation of the voice which reads out the exercise of abacus calculation, and/or an abacus etc., and it enables it to exchange it for arbitration. The voice regenerative apparatus 32 reproduces with voice the exercise of the abacus calculation remembered that voice is also to external storage 31.

[0032] Internal storage is equipment for once memorizing the numeric value and character code which were outputted from abacus blocking force equipment 1, and have been recognized with the arithmetic unit 30. As for the calculated value by which was memorized by internal storage and the number of \*\* was carried out to the body section 10 of an abacus, as compared with the correct answer of an exercise, a correct answer and a wrong answer are judged by the arithmetic unit 30. The result of this judgment is displayed by the output unit 33. A display and/or a printer constitute an output unit 33.

[0033] The abacus blocking force equipment and abacus practice equipment concerning this invention are constituted as mentioned above, and how to practice abacus calculation by each one next is explained.

[0034] Those who practice abacus calculation set what was chosen as arbitration from the external storage 31 which exists varieties, and as shown in drawing 3, where polymerization installation of the body section 10 of an abacus is carried out on the signal-processing putt section 20, they practice abacus calculation. An exercise reads out, and when it is \*\*, an exercise is reproduced from the voice regenerative apparatus 32. Those who practice abacus calculation move the bead 11 of the body section 10 of an abacus, hearing the voice. The number of \*\* in the middle of moving the number of \*\* or bead 11 of only a final answer shown by the location of the bead 11 and the number of \*\* of a final answer are recognized by the arithmetic unit 30, and are memorized by internal storage. This numeric value and the correct answer of external storage 31 are compared by the arithmetic unit 30, and a correct answer and a wrong answer are outputted to the display and/or printer of an output unit 33.

[0035] moreover, the signal-processing putt section 20 which functions considering the items of the purchased item as an alphabetic character input unit with the total amount of money when using it for count of an abacus of a housekeeping book -- since -- what is necessary is just to make it input By making the body section 10 of an abacus into the condition of having bounded as shown in drawing 4 and drawing 5, at this time, point 25a of the input pen 25 is touched at the alphabetic character of the keyboard side 22 of the signal-processing putt section 20, or the key of a notation.

[0036] Furthermore, when the external storage 31 which recorded the image is set, it can make it possible to master how to use an abacus, the history of an abacus, etc.

[0037] When many persons construct a network, it not only practices such abacus practice equipment 2 by each one, but it can perform simulation assay. When receiving simulation assay in each one of houses, those who receive simulation assay install above abacus practice equipment in each house, and connect the arithmetic unit 30 by circuits, such as the

telephone line. The host who takes the lead sets external storage 31. With an image and voice, notes of simulation assay which hit carrying out are reproduced by this external storage 31 from the output unit 33 and audio station of each house through the telephone line etc.

[0038] Moreover, when performing simulation assay in a classroom, abacus practice equipment 2 is installed in each one of desks, an arithmetic unit 30, external storage 31, the voice regenerative apparatus 32, etc. are installed in the platform, and they are connected by circuits, such as a cable. By doing so, the exercise memorized by external storage 31 from the voice regenerative apparatus 32 installed in the platform can be read out.

[0039] Those who receive simulation assay input a name and an examinee's number from the alphabetic character input section from the signal-processing putt section 20 as a condition which had been over about the body section 10 of an abacus as shown in drawing 4 and drawing 5. And if it considers as the condition of having put the body section 10 of an abacus on the signal-processing putt section 20 as shown in drawing 3, and an exercise is read out from the voice regenerative apparatus 32, the bead 11 of the body section 10 of an abacus will be moved. An answer is inputted into the arithmetic unit 30 of a host or the platform through a circuit etc., and a correct answer and a wrong answer are judged. And in the arithmetic unit 30 of a host or the platform, the results of those who received much simulation assays are calculated. These results are outputted by the output unit 33.

[0040] In addition, since it is premised on using the abacus blocking force equipment of this invention instead of the keyboard of a personal computer and will be naturally restricted to the digit count which can be processed supposing it can seldom lengthen width of face of the body section 10 of an abacus, it becomes desirable to use it in simulation assay of the 10th class to the 4th class. However, when not caring about die length, it is not restricted especially that what is necessary is just to constitute from a bead according to the digit count of the usual abacus.

[0041] Various modification is possible for this invention within the limits of the technical matter which is not limited to the gestalt of the above-mentioned implementation and was indicated by the claim. For example, the body section 10 of an abacus and the signal-processing putt section 20 cannot be connected on a hinge, but can also be considered as the configuration which equipped each with the Hall sensor component, and you may make it install them disengageable.

[0042]

[Effect of the Invention] Since change of the field produced in the shaft side by which fixed installation was carried out by moving the bead by which magnetic shielding was carried out is caught and he is trying to detect the location of a bead according to the abacus blocking force equipment of this invention While what were tinctured with magnetism moves, and influencing mutually is lost and being able to detect the number of \*\* by the bead certainly, structure becomes easy and cheap-ization of equipment can be attained. Moreover, since the input of an alphabetic character or a notation can also be performed, it can also be used instead of the keyboard of a personal computer.

[0043] Moreover, since according to the abacus practice equipment of this invention the correct answer of the exercise recorded on that numeric value and external storage is compared by the arithmetic unit and a correct answer and a wrong answer are outputted to an output unit while the location of the bead of abacus blocking force equipment is computed as a numeric value by the arithmetic unit, abacus calculation can be well practiced by each one. Since it has the alphabetic character input function, it not only inputs a numeric value, but with an abacus input unit, it can input the items purchased when using it as a name, an examinee's number, or a housekeeping book, and convenience improves.

[0044] Furthermore, since according to the network of the abacus practice equipment of this invention many men can exercise to the same problem to coincidence when much abacus practice equipments are connected by the circuit, the game and qualification test of abacus calculation not only by study at each home but two or more participants can be performed without gathering in the hall of a piece place, and preparation in the hall etc. becomes unnecessary. Moreover, the answer text of an assay problem etc. can also be delivered through a circuit.

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CLAIMS

## [Claim(s)]

[Claim 1] The bead which is abacus blocking force equipment which outputs the signal according to the number of \*\* of an abacus, and can carry out magnetic shielding to the arithmetic unit which connected external storage, an output unit, etc., The body section of an abacus which consists of a shaft made from a magnet which penetrates a bead, It consists of the signal-processing putt section which the Hall sensor component of a large number which detect the location of each bead of this body section of an abacus was made to correspond to the migration field of a bead, and has arranged it. Abacus blocking force equipment characterized by carrying out polymerization installation of the body section of an abacus to the signal-processing putt section in the condition in which separation or evacuation is possible among these Ryobe while arranging the above-mentioned body section of an abacus to the up side and arranging the above-mentioned signal-processing putt section to the down side.

[Claim 2] Abacus blocking force equipment according to claim 1 characterized by being what functions as an alphabetic character input means which can output the alphabetic character in which it was touched by touching each Hall sensor component to which the above-mentioned signal-processing putt section assigns the alphabetic character and the notation to each Hall sensor component, and the alphabetic character and the notation were assigned with the input pen which has a magnet, and a notation.

[Claim 3] The abacus blocking force equipment which has the detection function to detect the location of a bead, The external storage which recorded the exercise of abacus calculation etc. with voice and/or an image, While computing the number of \*\* of an abacus from the detection function of the voice regenerative apparatus which reads out the exercise of the abacus calculation memorized by the above-mentioned external storage with voice etc., and abacus blocking force equipment Abacus practice equipment characterized by having the arithmetic unit which judges a correct answer and a wrong answer as compared with the correct answer into which the number of \*\* was inputted from external storage, and the output unit which displays the image, and said correct answer and wrong answer of an exercise of the abacus calculation memorized by the above-mentioned external storage.

[Claim 4] Abacus practice equipment according to claim 3 with which abacus blocking force equipment is characterized by being a thing according to claim 1.

[Claim 5] Abacus practice equipment according to claim 3 with which abacus blocking force equipment is characterized by being a thing according to claim 2.

[Claim 6] The network of the abacus practice equipment characterized by connecting much abacus practice equipments of a publication to either of claims 3-5 by the circuit.

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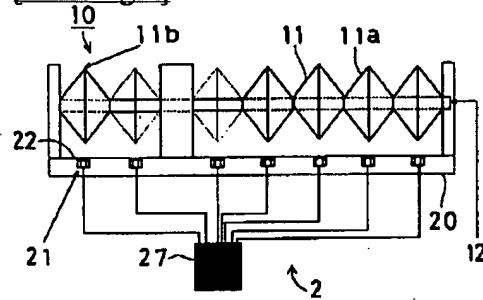
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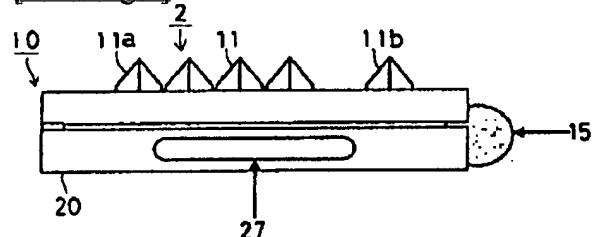
DRAWINGS

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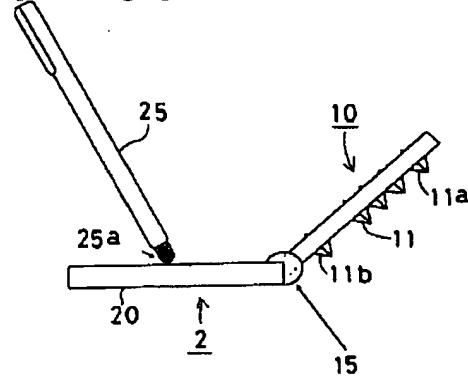
## [Drawing 2]



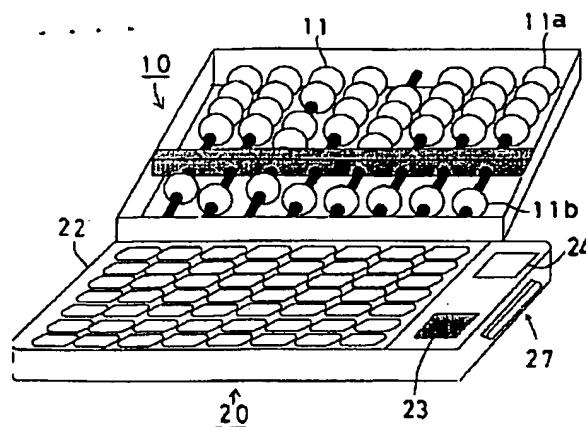
## [Drawing 3]



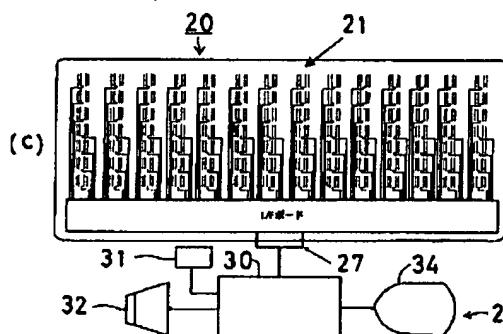
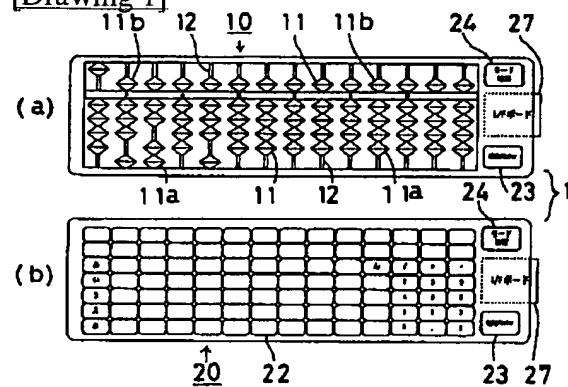
## [Drawing 4]



## [Drawing 5]



[Drawing 1]



1	ソロバン型入力装置
2	ソロバン練習装置
10	ソロバン本体部
11	ソロバン玉
12	軸棒
20	信号処理部
21	ホールセンサ素子

[Translation done.]